

Remarks

This Application has been carefully reviewed in light of the final Office Action mailed July 30, 2002. Because Applicant believes all pending claims are allowable in their present form, for at least the reasons provided below, no amendments have been made to the claims. Applicant respectfully requests reconsideration and favorable action in this case.

Drawings

Applicant has added element 111 to Figure 5 in response to the Examiner's comments in the Office Action mailed July 30, 2002. Figure 5 has been revised to show "determining a first optimal value according to the first optimization problem," and "determining a second optimal value according to the second optimization problem." The paragraph at Page 14, Line 24 through Page 15, Line 6 of the specification has been revised to conform the description to the revised Figure 5. Support for the revisions of Figure 5 and the specification may be found at, for example, Page 9, Lines 14-16 of the specification. Accordingly, no new matter has been added by the revision of either Figure 5 or the specification.

Additionally, Applicant has revised elements 34A and 34B of Figure 2 in response to the Examiner's comments in the Office Action mailed July 30, 2002. The Examiner notes that "The specification discusses maximizing 'X+Y', but the figures show maximizing 'X and Y'." (Office Action, Page 4, Paragraph 6) Figure 2 has been revised to show maximizing "X + Y".

Proposed drawing corrections are attached showing revisions in red. Additionally, a separate paper of the corrected drawings and a transmittal letter addressed to the Official Draftsperson are attached. Accordingly, Applicant respectfully requests withdrawal of the objection to the drawings.

Claims 1-47 are allowable under 35 U.S.C. § 112, first paragraph

The Examiner rejects Claims 1-47 under 35 U.S.C. § 112, first paragraph, "as containing subject matter which was not described in the specification in such a way to enable one skilled in the art to which it pertains, or with which it is most nearly connected, to make and/or use the invention.

First, according to the Examiner, although Claims 1, 17, and 33 recite "generating a global solution to a global optimization problem in accordance with the first optimal value, the second optimal value, the first value, and the second value," the specification "does not disclose how to generate a global solution according to these four values." The Examiner further states that "One of ordinary skill in the art would not be able to practice the claimed invention without undue experimentation." Applicant respectfully disagrees.

For example, the specification states:

A global solution may be defined as a union of mutually consistent solutions to the transmitted optimization problems of all parties 12 to the negotiation.

(Application, Page 7, Lines 7-9)

For problem transmission, each party 12 transmits an optimization problem to the broker 14 that includes at least one objective 34 of COP 32. Together with or separate from their optimization problems, parties 12 each also communicates a threshold or other suitable value relating to each transmitted objective 34. Broker 14 may, instead or in addition to receiving a threshold value from a party 12, generate an optimal value according the optimization problem for party 12, to which solution values will be compared. . . . For solution generation, the broker 14 generates a linear program (LP) or other suitable formulation of the global optimization problem and then uses an associated LP solver or other solution generator to generate at least one global solution 54 to the global optimization problem. . . . In one embodiment, the global solution 54 transmitted to any party 12 should solve the optimization problem of that party 12 such that the resulting value of each of the transmitted objectives 34 is not less than the corresponding threshold or otherwise inconsistent with the transmitted value to which it relates.

(Application, Page 9, Lines 10-30)

In the first round of discovery stage 52, parties 12a and 12b transmit to broker 14 their respective optimization problems, along with thresholds or other suitable values that correspond to objectives 34 included in the optimization problems. As described above, broker 14 may, instead or in addition to receiving a threshold from party 12, generate an optimal value according the optimization problem for the party 12, to which a solution value for party 12 are compared.

(Application, Page 12, Lines 8-13)

In particular, Applicant respectfully notes that the specification describes that broker 14 may, in addition to receiving first and second values from parties 12, generate first and second optimal values, respectively, according to the first and second optimization problems, respectively. Thus, the specification clearly describes "generating a global solution to a global optimization problem in accordance with the first optimal value, the second optimal value, the first value, and the second value," as recited in Claims 1, 17, and 33: (a) in such a way as to enable one skilled in the art to which it pertains, or with which it is most nearly connected, to make and/or use the invention; and (b) in such a way as to enable one of ordinary skill in the art to practice the claimed invention without undue experimentation.

Second, according to the Examiner, although Claims 1, 17, and 33 recite "determining a first optimal value according to the first optimization problem" and "determining a second optimal value according to the second optimization problem," the specification "does not disclose how to arrive at the first and second optimum values." The Examiner further states that "One of ordinary skill in the art would not be able to practice the invention as claimed without undue experimentation." Applicant respectfully disagrees.

As set forth above, the specification states:

For problem transmission, each party 12 transmits an optimization problem to the broker 14 that includes at least one objective 34 of COP 32. . . . Broker 14 may . . . generate an optimal value according the optimization problem for party 12, to which solution values will be compared.

(Application, Page 9, Lines 10-16)

Applicant respectfully notes, and surely the Examiner would agree, that techniques for generating an optimal value based on an optimization problem are well known to those of ordinary skill in the art. Furthermore, even if multiple techniques could be used, the present invention is not limited to any particular technique. Moreover, the Examiner states elsewhere in the Office Action, "For instance, it is noted in Fig. 2, objective 34A is to maximize X and Y. However, the solution which maximizes X ($X = 36.7$, $Y = 26.7$) is not the solution which maximizes Y ($X = Y = 33.3$)." (Office Action, Page 4, Paragraph 6) Thus, the specification clearly describes "determining a first optimal value according to the first optimization

problem" and "determining a second optimal value according to the second optimization problem," as recited in Claims 1, 17, and 33: (a) in such a way as to enable one skilled in the art to which it pertains, or with which it is most nearly connected, to make and/or use the invention; and (b) in such a way as to enable one of ordinary skill in the art to practice the claimed invention without undue experimentation.

The Examiner also rejects Claims 1-47 under 35 U.S.C. § 112, first paragraph, "as based on a disclosure which is not enabling" in that the fact that "the first and second optimization problems must be solvable for their respective optimum values is not shown in the specification." The Examiner states, "That the first and second optimization problems are each determinate systems so that they can be separately solved for their respective first and second optimum values is critical or essential to the practice of the invention, but not included in the claim(s) is not enabled by the disclosure." (Office Action, Page 3, Paragraph 3) The Examiner further states, "That the first and second optimization problems must be solvable for their respective optimum values is not shown in the specification." (Office Action, Page 3, Paragraph 3) Applicant respectfully disagrees.

Applicant does not necessarily agree with the Examiner's characterization of the recited first and second optimization problems as being "determinate systems so that they can be separately solved for their respective first and second optimum values" or of the criticality or essentiality of such a characteristic.

In any event, as set forth above, the specification states:

For problem transmission, each party 12 transmits an optimization problem to the broker 14 that includes at least one objective 34 of COP 32. . . . Broker 14 may . . . generate an optimal value according the optimization problem for party 12, to which solution values will be compared.

(Application, Page 9, Lines 10-16)

Applicants respectfully submit that, in describing generating an optimal value for a party according to an optimization problem for the party, the specification necessarily describes inherently the optimization problem being solvable to generate the optimum value.

If the situation were otherwise, an example claim reciting "receiving a message" as disclosed in an example specification might be rejected as based on a disclosure which is not enabling in that the fact that the message must be capable of being received is not explicitly described in the specification. This clearly cannot be the case, either in this simple example or with respect to the present application.

Furthermore, with respect to allegedly critical features, M.P.E.P. § 2164.08(c) states:

Limiting an applicant to the preferred materials in the absence of limiting prior art would not serve the constitutional purpose of promoting the progress in the useful arts. Therefore, an enablement rejection based on the grounds that a disclosed critical limitation is missing from a claim should be made only when the language of the specification makes it clear that the limitation is critical for the invention to function as intended. Broad language in the disclosure, including the abstract, omitting an allegedly critical feature, tends to rebut the argument of criticality.

Although the specification necessarily describes inherently the first and second optimization problems being solvable to generate the respective first and second optimum values, as discussed above, the specification does not include any language that "makes it clear that the limitation is critical for the invention to function as intended" as is required under the M.P.E.P. Moreover, the Abstract of the Disclosure in the present application includes broad language omitting the allegedly critical feature, which further rebuts the Examiner's argument of criticality.

For at least the above reasons, Applicant respectfully submits that Claims 1, 17, and 33 are in full compliance with 35 U.S.C. § 112, first paragraph. Applicant respectfully requests reconsideration and allowance of Claims 1-47.

Claims 1-47 are allowable under 35 U.S.C. § 112, second paragraph

The Examiner rejects Claims 1-47 under 35 U.S.C. § 112, second paragraph, "as being indefinite for failing to particularly point out and distinctly claim" the subject matter which Applicant regards as the invention. However, the Examiner provides no further explanation. Applicant respectfully requests that the Examiner withdraw the rejection or, if the rejection is maintained, that the Examiner provide clarification so that Applicant may respond. Applicant also respectfully notes M.P.E.P. § 2171 ("If a rejection is based on 35

U.S.C. 112, second paragraph, the examiner should further explain whether the rejection is based on indefiniteness or on the failure to claim what applicants regard as their invention."); M.P.E.P. § 2172 ("A rejection based on the failure to satisfy this requirement is appropriate only where applicant has stated, somewhere other than in the application as filed, that the invention is something different from what is defined by the claims. In other words, the invention set forth in the claims must be presumed, in the absence of evidence to the contrary, to be that which applicants regard as their invention."); and M.P.E.P. § 2173.02 ("Examiners are encouraged to suggest claim language to applicants to improve the clarity or precision of the language used").

The Examiner also rejects Claims 1-47 under 35 U.S.C. § 112, second paragraph, "as being incomplete for omitting essential elements or steps, such omission amounting to a gap between the elements or steps." According to the Examiner, "The omitted elements are: that the first and second optimization problems have constraint equations and objectives such that an optimal value can be determined for the objectives." Applicant respectfully disagrees.

Applicant does not necessarily agree with the Examiner's characterization of the recited first and second optimization problems as having "constraint equations and objectives such that an optimal value can be determined for the objectives" or of the criticality or essentiality of such a characteristic.

In any event, Applicant respectfully submits that in reciting generating an optimal value for a party according to an optimization problem for the party, Claims 1, 17, and 33 necessarily recite inherently the optimization problem being solvable to generate the optimum value. If the situation were otherwise, an example claim reciting "receiving a message" as disclosed in an example specification might be rejected as omitting essential elements or steps in that the fact that the message must be capable of being received is not explicitly recited in the claim. This clearly cannot be the case, either in this simple example or with respect to the present application.

Furthermore, Applicant respectfully notes that Claims 1, 17, and 33 explicitly recite a system, a method, and software, respectively, for multi-party "constrained" optimization and explicitly recite the first and second optimization problems comprising at least one first

"objective" and at least one second "objective," respectively. In addition, Claims 2, 18, and 34 explicitly recite that the first optimization problem comprises at least a portion of a "constrained" optimization problem and Claims 3, 19, and 35 explicitly recite the "constrained" optimization problem comprising at least one "constraint."

Moreover, as discussed above in connection with the Examiner's rejections under 35 U.S.C. § 112, first paragraph, M.P.E.P. § 2164.08(c) states with respect to allegedly critical features:

Limiting an applicant to the preferred materials in the absence of limiting prior art would not serve the constitutional purpose of promoting the progress in the useful arts. Therefore, an enablement rejection based on the grounds that a disclosed critical limitation is missing from a claim should be made only when the language of the specification makes it clear that the limitation is critical for the invention to function as intended. Broad language in the disclosure, including the abstract, omitting an allegedly critical feature, tends to rebut the argument of criticality.

Although the specification describes, in one embodiment, the first and second optimization problems being constrained optimization problems comprising constraints, the specification does not include any language that "makes it clear that the limitation is critical for the invention to function as intended" as is required under the M.P.E.P. The Abstract of the Disclosure in the present application includes broad language omitting the allegedly critical feature, which also rebuts the Examiner's argument of criticality. In addition, as noted above, these features are explicitly recited in Claims 2-3, 18-19, and 34-35 rather than in Claims 1, 17, and 33, further rebutting the Examiner's argument through the principle of claim differentiation.

For at least the above reasons, Applicant respectfully submits that Claims 1, 17, and 33 are in full compliance with 35 U.S.C. § 112, second paragraph. Applicant respectfully requests reconsideration and allowance of Claims 1-47.

Claims 1-47 are allowable under 35 U.S.C. § 103(a)

The Examiner rejects Claims 1-47 under 35 U.S.C. § 103(a) as being unpatentable over U.S. Patent No. 5,495,412 to Thiessen et al. (*Thiessen*). Applicant respectfully submits

that *Thiessen* fails to disclose, teach, or suggest the combination of limitations specifically recited in Applicant's claims.

Independent Claims

The Examiner admits that "Thiessen does not show determining first and second optimal values according to the first and second optimization problems, respectively (it is noted however, that the global solution would be 'in accord' with the first and second values as broadly claimed)." However, according to the Examiner, in hindsight, "it would have been an obvious matter of design choice to determine first and second optimal values and solve the problem according to them since the specification does not show that this step is for any particular reason or solves a particular problem and it appears that the method would work equally well in either configuration."

Applicant respectfully submits that the rejection is improper because the Examiner has not shown the required suggestion or motivation in *Thiessen* or in the knowledge generally available to one of ordinary skill in the art at the time of the invention to modify *Thiessen* in the manner the Examiner proposes. "The mere fact that references can be combined or modified does not render the resultant combination obvious unless the prior art also suggests the desirability of the combination." M.P.E.P. § 2143.01 (emphasis in original). Nothing in *Thiessen* or in any other prior art of record suggests or motivates the proposed modification, nor has the Examiner provided specific evidence that suggests or motivates the proposed modification.¹ Applicants respectfully note that speculation in hindsight that "it would have been an obvious matter of design choice" is insufficient under the M.P.E.P. and governing Federal Circuit case law.

In addition, contrary to the Examiner's assertions, the specification does provide one or more reasons to determine first and second optimal values according to the first and second optimization problems, respectively, as recited in Claims 1, 17, and 33.

¹ If "common knowledge" or "well known" art is being relied on, Applicants respectfully request that a reference be provided in support of this position pursuant to M.P.E.P. § 2144.03. If personal knowledge is being relied on to supply the required motivation or suggestion to modify, Applicants respectfully request that an affidavit supporting such facts be provided pursuant to M.P.E.P. § 2144.03.

For example, in one embodiment, the specification states:

Broker 14 may, instead or in addition to receiving a threshold value from a party 12, generate an optimal value according the optimization problem for party 12, to which solution values will be compared.

(Application, Page 9, Lines 14-16)

Using an equal distribution criterion, the values of objectives 34 for parties 12 must exceed their corresponding thresholds by the same amount. For example, if the thresholds for parties 12a and 12b are (10, 50), then both (20, 60) and (100, 140) are deemed fair, but (20, 100) is not. ... Using a minimum deviation from optimal criterion, instead of using thresholds, the optimal values of objectives 34 (which broker 14 may generate according to the transmitted optimization problems) are used while considering all the transmitted constraints 36 that relate to the objectives 34.

(Application, Page 10, Lines 14-32)

That is, a global solution may be compared to the first and second optimal values to determine whether the global solution is fair. Accordingly, the specification provides a reason for determining first and second optimal values according to the first and second optimization problems, respectively, as recited in Claims 1, 17, and 33.

Furthermore, since *Thiessen* fails to disclose, teach, or suggest determining first and second optimal values according to the first and second optimization problems, respectively, as recited in Claims 1, 17, and 33, the procedure disclosed in *Thiessen* may yield solutions that are not in accordance with the objectives of the parties. Similarly, and contrary to the Examiner's assertion, the invention recited in Claims 1, 17, and 33 would not work equally well with or without determining first and second optimal values according to the first and second optimization problems, respectively.

If anything, *Thiessen* teaches away from the proposed modification. As discussed in Applicant's response to an Office Action mailed March 15, 2002, *Thiessen* merely discloses determining a satisfaction function for each party, combining the satisfaction functions to generate an optimization problem, and then solving the optimization problem. Given the limited disclosure of *Thiessen*, there would be no reason whatsoever to determine "a first

optimal value according to the first optimization problem" and determine "a second optimal value according to the second optimization problem" in generating a global solution to a global optimization problem as recited in Claims 1, 17, and 33.

For at least the above reasons, Applicant respectfully requests reconsideration and allowance of independent Claims 1, 17, and 33, and all claims that depend on these claims.

Dependent Claims

Applicant has demonstrated Claims 1, 17, and 33 to be allowable. Claims 2-16, 18-32, and 34-47 depend on Claims 1, 17, and 33, respectively, and are also allowable for at least this reason. In addition, these dependent claims recite numerous additional patentable distinctions over the prior art of record.

For example, *Thiessen* does not disclose, teach, or suggest receiving "filtering information from the first party and the second party" and using "the filtering information to determine one or more filtered solutions from among the global solutions according to a filtering approach," as recited by Claims 11, 27, and 43. The Examiner states that *Thiessen* discloses "communicating possible alternative solutions to the parties, and receiving and applying filtering information comprising a weighted preferences approach from the parties," that *Thiessen* does not disclose "accomplishing these steps after computation of the global solution," and that "it would have been an obvious matter of design choice to modify the method of Thiessen by accomplishing the filtering steps after the global solution has been computed since applicant does not state that accomplishing the filtering in this manner at this time if for any particular reason . . . and it appears that the method would work equally well in either configuration." (Office Action, Pages 6-7)

First, Applicant again respectfully notes that a conclusory statement, necessarily involving speculation in hindsight, that "it would have been an obvious matter of design choice" is insufficient under the M.P.E.P. and governing Federal Circuit case law.

Second, contrary to the Examiner's assertions, the specification explicitly provides one or more reasons for receiving "filtering information from the first party and the second party" and using "the filtering information to determine one or more filtered solutions from

among the global solutions according to a filtering approach," as recited by Claims 11, 27, and 43. For example, as explicitly described in the specification, a solution filtering stage 56 may be performed "to discard any unacceptable discovered global solutions 54 and generate a set of one or more filtered solutions 58" and to allow a solution selection stage 60 "to select a single global solution 54 from among the filtered solutions 58 and generate a set of one or more selected solutions 62." (Application, Page 8, Lines 23-26) It is axiomatic that filtering of global solutions must be performed after the global solutions have been generated. Furthermore, also as explicitly described in the specification, filtering stage 56 may allow parties 12 to, for example: (1) veto global solutions 54; (2) rank global solutions 54 such that global solution 54 lacking Pareto-optimal rankings are discarded; (3) provide values for global solutions 54 indicating the relative strength of their preferences for global solutions 54 such that global solutions 54 that optimize the total weight are determined and remaining global solutions 54 are discarded; and (4) combine two or more of the above. (Application, Page 11, Lines 3-12) Aspects relating to these alternatives are recited in Claims 12, 28, and 44 which depend on Claims 11, 27, and 43, respectively.

Moreover, Applicant respectfully submits that there is no required motivation to modify *Thiessen* to include the recited features, if such were even possible, especially in light of the stringent standards for doing so under the M.P.E.P. and governing Federal Circuit case law. Accordingly, Applicant respectfully requests reconsideration and allowance of Claims 11-12, 27-28, and 43-44, and all claims that depend on these claims.

As another example, *Thiessen* does not disclose, teach, or suggest using "the selection information to determine a selected solution from among the solutions according to a selection approach," as recited in Claims 13, 29, and 45, or the selection approach being selected from the group consisting of "an auction approach" and "a random selection approach," as recited in Claims 14, 30, and 46. The Examiner admits that *Thiessen* "does not disclose choosing the solution via an auction approach." (Office Action, Page 7) Applicant respectfully submits that there is there is no motivation to modify *Thiessen* to include these features, if such were even possible, especially in light of the stringent standards for doing so set forth above. Applicant again respectfully notes that a conclusory statement, necessarily involving speculation in hindsight, that "It would have been obvious" is insufficient under the

M.P.E.P. and governing Federal Circuit case law. Accordingly, Applicant respectfully requests reconsideration and allowance of Claims 13-14, 29-30, and 45-46.

Because Applicant believes the allowability of the independent claims and certain dependent claims has been amply demonstrated, and to avoid further burdening the record, Applicant has not provided detailed remarks concerning other dependent claims. However, Applicant remains ready to provide such remarks if it becomes appropriate to do so.

For at least these reasons, Applicant respectfully requests reconsideration and allowance of dependent Claims 2-16, 18-32, and 34-47.

Conclusion

Applicant has made an earnest attempt to place this case in condition for allowance. For at least the foregoing reasons, Applicant respectfully requests full allowance of all the pending claims.

If the Examiner believes a telephone conference would advance prosecution of this case in any way, the Examiner is invited to contact Christopher W. Kennerly, the Attorney for Applicant, at the Examiner's convenience at (214) 953-6812.

Although Applicant believes no fees are due, the Commissioner is hereby authorized to charge any fees or credit any overpayments to Deposit Account No. 02-0384 of Baker Botts L.L.P.

Respectfully submitted,

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Mark-Ups Reflecting Changes to Specification

For the convenience of the Examiner, the following mark-ups reflect the changes to the specification.

Please replace the paragraph at page 14, line 24 through page 15, line 6 with:

Broker 14 generates an optimal value for each party 12 according to the optimization problem for each party 12 at step 111. At step 112, broker 14 generates a linear program or other suitable formulation of the global optimization problem according to the multiple optimization problems and values received from parties 12 and, at step 114, generates a corresponding global solution 54. As part of or separate from discovering the global solution 54, broker 14 determines whether any excess exists at step 116 and, at step 118, distributes any such excess among parties 12 according to one or more previously agreed upon or other suitable fairness criteria. Broker 14 may also perform one or more Pareto-optimality passes at step 120, as part of or separate from determining the global solution 54, to achieve Pareto-optimality. Broker 14 transmits global solution 54 to parties 12 at step 122, substantially simultaneously or in any relative order. In one embodiment, if a next round of discovery stage 52 is to be performed at step 124, the method returns to step 110, where parties 12 may transmit new thresholds or other values to the broker 14. Otherwise, discovery stage 52 ends, filtering stage 56 may begin if desired, and the method proceeds to step 126, where parties 12 transmit suitable filtering information to broker 14 according to a previously agreed upon or other filtering approach.